WE CLAIM:

1. A multimedia packet re-multiplexer system having a plurality of multimedia sources, each multimedia source sending incoming multimedia packets, each packet having a header which includes a packet identifier (PID) to determine the packet type, said system comprising:

an interface multiplexer (mux) for periodically scanning the multimedia sources for the incoming packets;

a main storage device for storing each incoming packet;

a secondary storage device having a cut-through mechanism for storing the header of each incoming packet;

an input classifier for selecting a process for each packet stored in said main storage device, in accordance with the corresponding header from said secondary storage device;

a plurality of processors, each corresponding to a packet type; and

an input dispatcher for sending each packet from said main storage device to one of said plurality of processors selected in accordance with availability,

such that said cut-through mechanism provides efficient digital video processing via said plurality of processors, enabling gigabit bandwidth throughput for digital video re-multiplexing.

2. The system of claim 1, wherein the packet types are among the following:
video;
audio;
data; and
stuffing (filler),

3. The system of claim 2, further comprising:
a plurality of output ports capable of transmitting the packetized video;
an output classifier, deciding for each packet, to which of said plurality of output ports to route said packet; and

an output dispatcher, sending packets stored in said main memory to said output port.

4. The system of claim 2, wherein said multimedia packets are in Digital Video Broadcasting Asynchronous Serial Interface (DVB/ASI) format and are framed to Packet Over Sonet (POS) format.

5. The system in claim 12, wherein said multimedia packets are in DVB/ASI format and are framed to Gigabit Media Independent Interface (GMII) format.

6. The system in claim 2, wherein said multimedia packets are in DVB/ASI format and are framed to Serial Media Independent Interface (SMII) format.

7. The system in claim 3, wherein each of said plurality of output ports comprises two ports, a first port for transmission of packets with high priority, and a second port for transmission of packets with low priority.

8. The system according to claim 2, further comprising a homogeneous null stuffing module adapted to provide for transmission of constant bit-rate (CBR) streams, said homogeneous null stuffing module comprising:

a high priority first-in/first-out (FIFO) buffer filled with packets coming from said packets router;

a low priority FIFO buffer continuously filled with null packets to a pre-defined level; and

an arbiter continuously scanning said high priority FIFO buffer and said low priority FIFO buffer, according to the following procedure:

scanning said high priority FIFO buffer until it is empty;
taking a null packet from said low priority FIFO buffer; and
returning to scan the high priority FIFO buffer.

9. A method for re-multiplexing a plurality of multimedia packets, each packet having a header, the header having a packet identifier (PID) field used to determine the packet type, the method comprising:

periodically scanning for full incoming packets;

storing said full incoming packets in a main memory device;

using a cut-through mechanism for storing the header of each incoming packet in a secondary memory device;

examining the header, wherein said examining activity further comprises:

classifying each video packet type in a classification according to its PID; and

identifying the required process according to said classification;

selecting, according to availability, among a plurality of processors, which of said processors is to handle each said classified packet; and

processing the packets stored in said main memory device in said selected processor;

such that said cut-through mechanism provides efficient digital video processing via said plurality of processors, enabling gigabit bandwidth throughput for digital video re-multiplexing.

10. The method according to claim 9, wherein the packets of the multimedia sources are in DVB format, are originally received in ASI protocol and are framed to POS protocol.

11. The method according to claim 9, wherein the packets of the multimedia sources are in DVB format, are originally received in ASI protocol and are framed to ten-bit interface (TBI) protocol.

12. The method according to claim 9, wherein the packets of the multimedia sources are in DVB format, are originally received in ASI protocol, and are framed to GMII protocol.

13. The method according to claim 9, wherein the packets of the multimedia sources are in DVB format, are originally received in ASI protocol and are framed to SMII protocol.

14. The method according to claim 9, further comprising adding a time stamp to each packet, wherein the time is taken from a free-running system clock (27MHz) immediately when it enters the system; and just before the packet is transmitted from the system, updating a Program Clock Reference (PCR) value according to the time passed from its entrance.

15. The method according to claim 9, further comprising adapting a homogeneous null stuffing module to provide for transmission of constant bit-rate (CBR) streams, wherein said adapting activity further comprises:

filling a high priority FIFO buffer with packets coming from said packets router;

continuously filling a low priority FIFO buffer with null packets to a pre-defined level; and

continuously scanning, via an an arbiter, said high priority FIFO buffer and said low priority FIFO buffer, according to the following procedure:

scanning said high priority FIFO buffer until it is empty;
taking a null packet from said low priority FIFO buffer; and
returning to scan the high priority FIFO buffer.